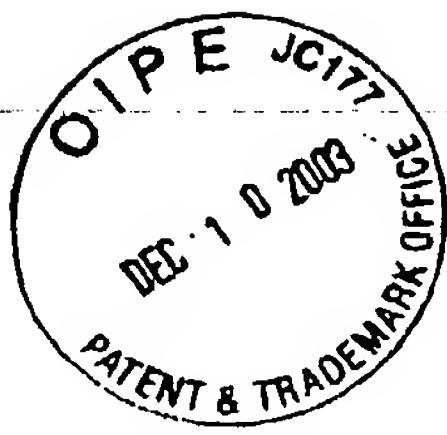


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SUBSTITUTE SPECIFICATION



SEMICONDUCTOR POWER CONVERTING APPARATUS

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[0001] This application is a continuation of U.S. Application Serial No. 10/099,950, filed March 19, 2002, the entire disclosure of which is hereby incorporated by reference.

BACKGROUND OF THE INVENTION

[0002] The present invention generally relates to a semiconductor power converting apparatus with employment of semiconductor elements and the like. More specifically, the present invention is directed to a semiconductor power converting apparatus capable of suppressing an occurrence of an overvoltage while a switching operation is carried out.

[0003] As disclosed in IPEC2000 S-17-3 "Development of IEGT series and Parallel Connection Technology for High Power Converters", each of the arms of a power converter is constituted by a series connection of MOS control semiconductor devices such as IGBTs (insulated-gate bipolar transistors), so that a MOS control semiconductor power converter for outputting a high AC voltage and a high DC voltage can be realized. Since the MOS control semiconductor elements which are series-connected to each other and constitute each of these arms are turned ON or OFF at the same time in response to a pulse signal controlled by either the PWM (pulse width modulation) control or the PAM (pulse-amplitude modulation) control, the DC voltage may be converted into the AC voltage and/or the AC voltage may be converted into the DC voltage.

[0004] On the other hand, in another known technique, there are disclosed MOS control semiconductors series-connected to each other, which constitute the respective arms, that may be protected from overvoltages. The published